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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/600,897 | 09/18/2000 | William Levy | 0513/00548 | 1829 |

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Pollock Vande Sande & Amernick
PO Box 19088
Washington, DC 20036-3425

| EXAMINER | |
|---|---|
| DOROSHENK, ALEXA A | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1764 | |

DATE MAILED: 11/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/600,897 | LEVY ET AL. | |
| | Examiner | Art Unit | |
| | Alexa A. Doroshenk 1800 | 1764 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) 12-22 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 12-22 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 9/18/00 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

## DETAILED ACTION

### *Specification*

1. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

2. It is suggested that applicant amend the specification to include the appropriate section headings. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

### Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.
(b) CROSS-REFERENCE TO RELATED APPLICATIONS.
(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
(d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
(e) BACKGROUND OF THE INVENTION.
(1) Field of the Invention.
(2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
(f) BRIEF SUMMARY OF THE INVENTION.
(g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
(h) DETAILED DESCRIPTION OF THE INVENTION.
(i) CLAIM OR CLAIMS (commencing on a separate sheet).
(j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
(k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if

the required "Sequence Listing" is not submitted as an electronic document on compact disc).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 12-18, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Girod et al. (5,525,311) and Allam et al. (5,324,452).

With respect to claim 12, Girod et al. discloses a sealed enclosure (31) for plate heat exchange reactor arrangements (col. 2, line 60 - col. 3, line 1) for a hydrocarbon reforming process ( col. 4, line 64 - col. 5, line 3) made up of a stack of metal (col. 7, lines 1-4) corrugated plates (10) which form channels (20 and 30). In these channels, two circulation systems are formed, A and B, wherein the reactive fluid and heat exchange fluid respectively, flow in crosswise directions, i.e. perpendicular and through alternate channels formed between adjacent plates (col. 6, lines 43-63). The channels of system A, in which the reactant fluid circulates, include a catalyst (col. 7, lines 44-48).

Girod et al. fails to disclose of a system which provides for a third fluid circulation of heat exchange fluid in opposite flow direction to heat exchange circulation system, B.

Allam et al. discloses a plate heat exchange apparatus for use with a hydrocarbon reformation process which is a three-stream heat exchanger. In the device of Allam et al, (fig. 4) it can be seen that a first fluid flows through channels (438) via admission and discharge means (414 and 424) while second (channels 434 and admission and discharge means 416 and 418) and third (channels 436 and admission and discharge means 412 and 422) heat exchange streams travel perpendicularly and in opposite flow direction thereto. It can also be seen in figure 4 that each channel of the first series (438) is arranged between the channels of the second (434) and of the third (436) series respectively.

Allam et al. recites several advantages to using such a multi-stream heat exchange device, including that it is efficient and compact, that all feed and effluent process streams for the reformation reaction can be heat exchanged in such a heat exchanger without duplication of heat exchange equipment and that process streams can be readily removed directly, and without any intervening processing, from the exchanger core through an appropriate manifold at substantially the exact temperature desired (col. 6, lines 40-67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a third stream as well as the admission and discharge means for the streams into the reforming stream heat exchange enclosure of Girod et al., as taught by Allam et al., in order to achieve all of the advantages taught by Allam et al., discussed above.

With respect to claims 13 -16, as provided by Allam et al. (discussed above) each stream has its own pipe and manifold communicating with the associated channels for input and removal of the fluids. The first fluids has channels (438), pipe (424) and manifold (header) (414). The cooling fluids have channels (434) with associated pipe (418) and manifold (header) (416) and channels (436) with associated pipe (422) and manifold (header) (412).

With respect to claim 17, Girod et al. discloses wherein the channels of the first fluid, A, are filled with catalyst and joined to means for filling and discharging the catalyst (col. 10, lines 33-48).

With respect to claim 18, Girod et al. discloses, as shown in the specific arrangement of FIG. 5, wherein the reactor contains means for passing catalyst into

channels of the reaction stack (36) and means for withdrawing catalyst (47) well as catalyst feed pipes (46) (which read on manifold) which receive fresh catalyst particles and then divide in to pipes (46a and 46b) that deliver catalyst particles to the upper part of an individual reaction stack (36) (col. 10, lines 34-42).

Claims 21 and 22 do not recite any structural limitations and therefor continue to read on the references as discussed above. The claimed recitations of what materials can be fed into the apparatus are interpreted by the examiner as being recitations with respect to the manner in which the claimed apparatus is intended to be employed and does not differentiate the claimed apparatus from the prior art apparatus since the prior art apparatus teaches all the structural limitations of the claim. Exparte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). See MPEP 2114.

7. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Girod et al. (5,525,311) and Allam et al. (5,324,452) in view Hundtofte (3,608,751).

With respect to claim 19, Girod et al. discloses that catalyst particles may be removed from the vertically arranged reactor either periodically or continuously (col. 10, lines 43-48) but fails to disclose how the catalyst is supported during a fixed-bed state.

Hundtofte teaches a method and device for loading catalyst particles into vertical tubes, suitable for reforming (col. 4, lines 21-22), and discloses that providing a grate is a conventional type of means for supporting a catalyst in a tube (col. 2, lines 47-50). It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the teaching of a support grate in Hundtofte to support the catalyst of

Girod et al. when catalyst is not being continuously removed, in a fixed-bed state, from the vertically arranged device.

8. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Girod et al. (5,525,311) and Allam et al. (5,324,452) in view of Tomasko et al. (5,499,649).

With respect to claim 20, though Girod et al. discusses the desire to control the pressure of the device and minimize pressure drop (col. 5, lines 20-31) Girod et al. and Allam et al. fail to provide at least one rupture disk.

Tomasko et al. teaches a rupture disk and its benefit as a pressure relief device at a predetermined pressure in fluid passageways (col. 1, lines 11-13 and col. 1, line 66 - col. 2, line 12). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a rupture disk to the modified device of Girod et al. in order to ensure that the required pressure levels are maintained and too much pressure is avoided.

***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexa A. Doroshenk whose telephone number is 703-305-0074. The examiner can normally be reached on Monday - Thursday from 9:00 AM - 7:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 703-308-6824. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Please make note that after December 10, 2003 the examiner can be reached at her new phone number 571-272-1446 and the examiner's supervisor, Glenn Caldarola, can be reached at his new phone number 571-272-1444.

Alexa Doroshenk
Patent Examiner
Art Unit 1764

November 17, 2003